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EXAMINER

ALI, MOHAMMAD M

ART UNIT

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3744

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/522,920 | Applicant(s) RICHTER ET AL. | |
| | Examiner MOHAMMAD M. ALI | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by G. E. Flurschutz hereinafter Flurschutz (U. S. Pat. No. 2,731,243.)

In regard to claims 1 and 2, Figs. 1, 2, 3 and 5 of Flurschutz discloses a heat exchanger, with a soldered/brazed/joined heat exchanger network consisting of flat tubes/channels (20/22) and of corrugated ribs/fins (17), a liquid and/or gaseous medium being capable of flow through the flat tubes and air being capable of flow around the corrugated ribs, (see Fig.2 for air passage), a corrugated rib (17) having in each case two rib surfaces (17, see Fig. 5) which are arranged essentially parallel to one another (see Fig. 5), and which are connected in each case by means of an arcuate piece (14, see Fig. 3 and 5) soldered/brazed/joined to a flat tube (20), characterized in that the arcuate piece (14) has a lower curvature in a middle portion than in a first outer portion and in a second outer portion, (see Figs 3 and 5), (as per claim 1); a heat exchanger in that the rib surfaces are equipped with gills (see the air passage 16 in Figs 3 and 5), (as per claim 2.)

In regard to claims 3-6, Figs. 8 of Flurschutz discloses a heat exchanger with the radius of curvature of the arcuate piece greater than the rib height, (as per claim 3), with the arcuate piece having in the first outer portion a radius of curvature which is lower than half a rib height of the corrugated rib (as per claim 4), the arcuate piece having in the second outer portion a radius of curvature which is greater than or equal to a radius of curvature in the first outer portion, (as per claim 5), the arcuate piece having in the second outer portion a radius of curvature which is lower than a rib height of the corrugated rib, (as per claim 6), (see col. 4, ln. 26-29).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz in view of Yamaguchi et al (US 3,724,538). Flurschutz discloses the invention substantially as claimed as stated above except gills are arranged as louvers and flat rib. Yamaguchi et al teach the use of gills arranged in as louvers (13, see Figs 5-6, column 5, lines 36-55) in heat exchanger for the purpose of providing large heat exchange efficiency (see column 3, lines 19-21). Yamaguchi et al also teach the use of flat ribs (See Figs 6, 8-9 and 14 for the to increase heat exchange efficiency. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heat exchanger of Flurschutz in view of Yamaguchi et al such that louvered gill and flat ribs could be provided in order to increase the heat exchange efficiency.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, as applied to claim 1 above, in view of Kuroyanagi et al., (U. S. Pat. No. 6,308,527 B1).

It is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib division in the range of 1 to 3 mm.

However, Fig. 6B of Kuroyanagi et al. teaches the corrugated rib has a rib division (fp), in the range of 1 to 3 mm, (see col. 8., ln. 18.) Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib division of Kuroyanagi et al.

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resulting in a heat exchanger that would improve the heat transmission on the air side.

7. Claims 9 , 11, 12-15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, as applied to claim 1 above, in view of Shimoya et al. (U. S. Pat. No. 7,231,965 B2).

In regard to claim 9, it is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib depth in, the range of 10 to 70 mm.

However, Fig. 16 of Shimoya et al. teaches the corrugated rib has a rib depth (B, and see col. 5, ln. 57-59) in the range of 10 to 70 mm. Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib depth of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

In regard to claim 11, it is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that corrugated rib has a rib height in a range of 3 to 15 mm.

However, Fig. 19 of Shimoya et al. teaches the corrugated rib has a rib height (C) in a range of 3 to 15 mm. (see col. 15, ln 65-67, and col. 16, ln. 1-3, and 21-32). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib height of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

Regarding claims 13-15, Shimoya et al disclose the rib depth of 10 to 70 mm which meets the limitations of claims 13-15 too.

Regarding claim 16, the heat exchanger of Flurschutz is capable of being used in motor vehicle as a refrigerant condenser.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz in view of Shimoya et al., and further in view of Hu et al., (U. S. Pat. No. 6,805,193 B2).

It is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the gills have a gill depth in a range of 0.5 to 1.5 mm and a gill angle in the range of 20 degree to 35 degree.

However, Fig. 7 of Shimoya et al. further discloses a gill depth (P) in a range of 0.5 to 1.5 mm, (see col.13, ln. 22-26); and Fig. 7 of Hu et al discloses a gill angle in the range of 20 degree to 35 degree (see col. 2, ln. 54-58). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the gill depth of Shimoya et al. and the gill angle of Hu et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, in view of Kuroyanagi et al., and further in view of Shimoya et al.

It is noted that Flurschuts does not specifically disclose the heat exchanger characterized in that the ratio of gill depth LP to rib division FP is in a range of 0.385 to 0.825. It is also noted that not all of the ranges of LP and FP of the invention fall into a ratio range of 0.385 to 0.825.

However, Fig. 6B of Kuroyanagi et al. teaches a rib division of 2.6 mm, and Fig. 7 of Shimoya et al. teaches a gill depth of 0.75 mm resulting in a gill depth to rib division ratio of 0.288. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz in view of Kreutzer et al (US 5,361,829 A). Flurschutz discloses the invention substantially as claimed as stated above except soldering of rib. Kreutzer et al teach the use of soldering the rounded rib portion 4 with flat tubes 2 in a heat exchanger for the purpose of efficient heat transfer. See column 2, lines 40-41. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heat exchanger of Flurschutz in view of Kreutzer et al such that ribs could be soldered with the flat channels in order to exchange heat in efficient manner..

Response to Arguments

Applicant's arguments filed 05/27/09 have been fully considered but they are not persuasive. The Applicants argue that the arcuate regions of the sinuously bent wires of Flurschutz do not have portions with different curvatures. In fact, the wires shown in Figures 3, 5, and 9 of Flurschutz appear to have constant, uniform curvatures throughout any arcuate portions of the wires.

Furthermore, any straight or flat portion of the sinuously bent wires, such as the portions forming the fins 17, cannot be part of an arcuate region of a rib, as recited in claim 1, because such straight or fiat portions do not have an arcuate shape. Thus, the straight or flat portions of the sinuously bent wires that form the fins 17 cannot be considered to be part of an arcuate piece that has a different curvature than another part of the arcuate piece, as recited in claim

1. Claims 2-6 depend from claim 1.

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For at least the reasons discussed above, Flurschutz does not anticipate claims 1-6 because Flurschutz does not disclose all of the features of claim 1. Applicant respectfully requests reconsideration and withdrawal of this rejection. The Examiner disagrees. The phrase "different curvatures" is not the claimed subject matter. However, Flurschutz clearly disclose different curvatures of fins 17 as shown in Fig. 3. The curvature as shown by numeral 14 in the entire left hand portion of Fig. 3 is different from the curvature of entire right hand portion of Fig. 3. The fin curvature at the mid portion of Fig. 9 is different from the fin curvature of two end portion. Therefore, the above argument that Flurschutz does not have portions with different curvatures is not true. Therefore, the rejections are valid.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD M. ALI whose telephone number is (571)272-4806. The examiner can normally be reached on maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4808. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad M Ali/
Primary Examiner, Art Unit 3744